



**US Army Corps
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Seattle District

Snoqualmie River Flood Damage Reduction Project

PROPOSED PROJECT
AND
DOWNSTREAM IMPACTS



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U.S. Army Corps of Engineers

Overview



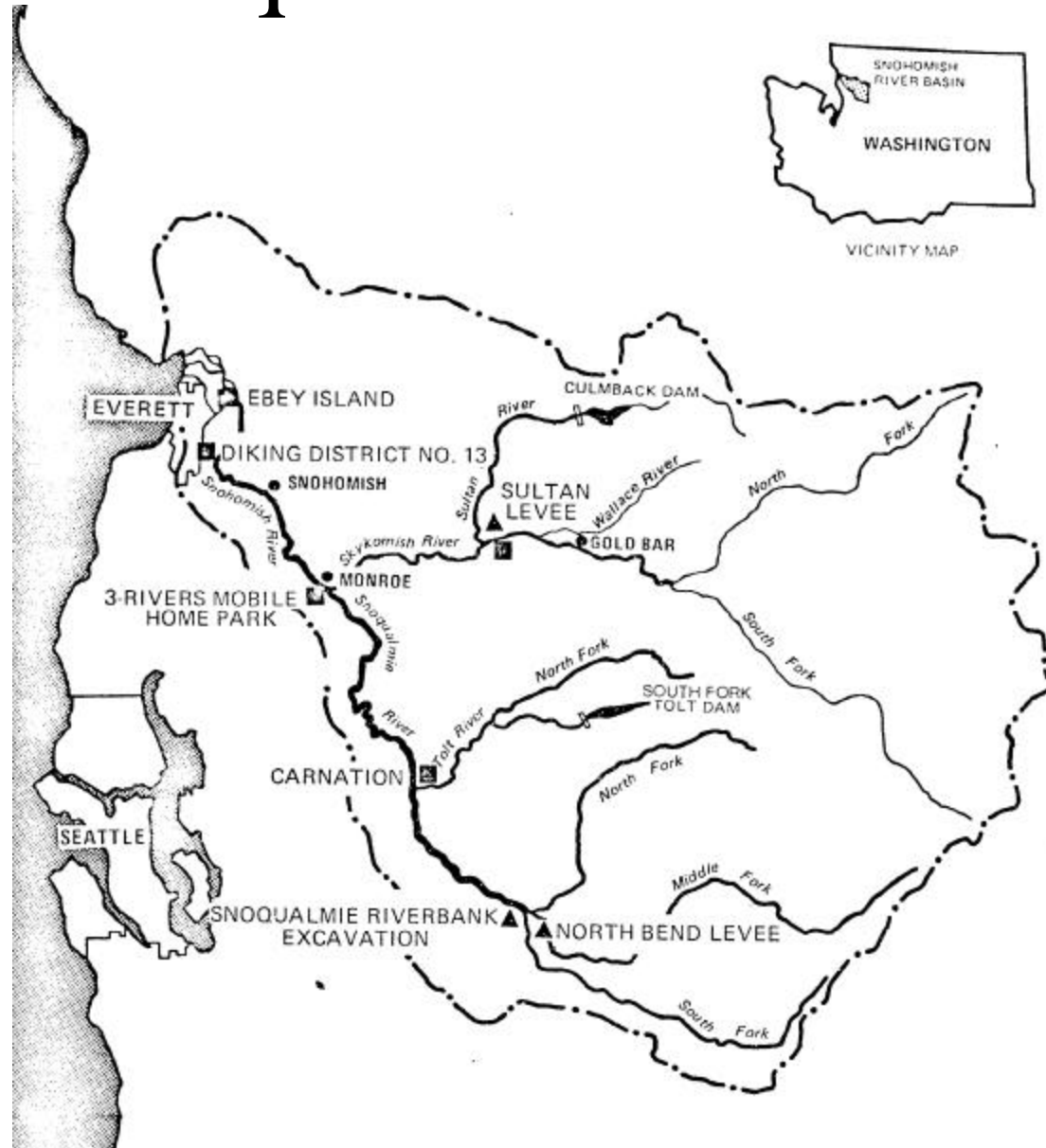
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- Past Projects and Impact Studies
 - Snohomish Mediated Agreement (1981)
 - Snoqualmie R. FDR Project (1988)
- Present Project and Impact Studies

Snoqualmie R. Basin



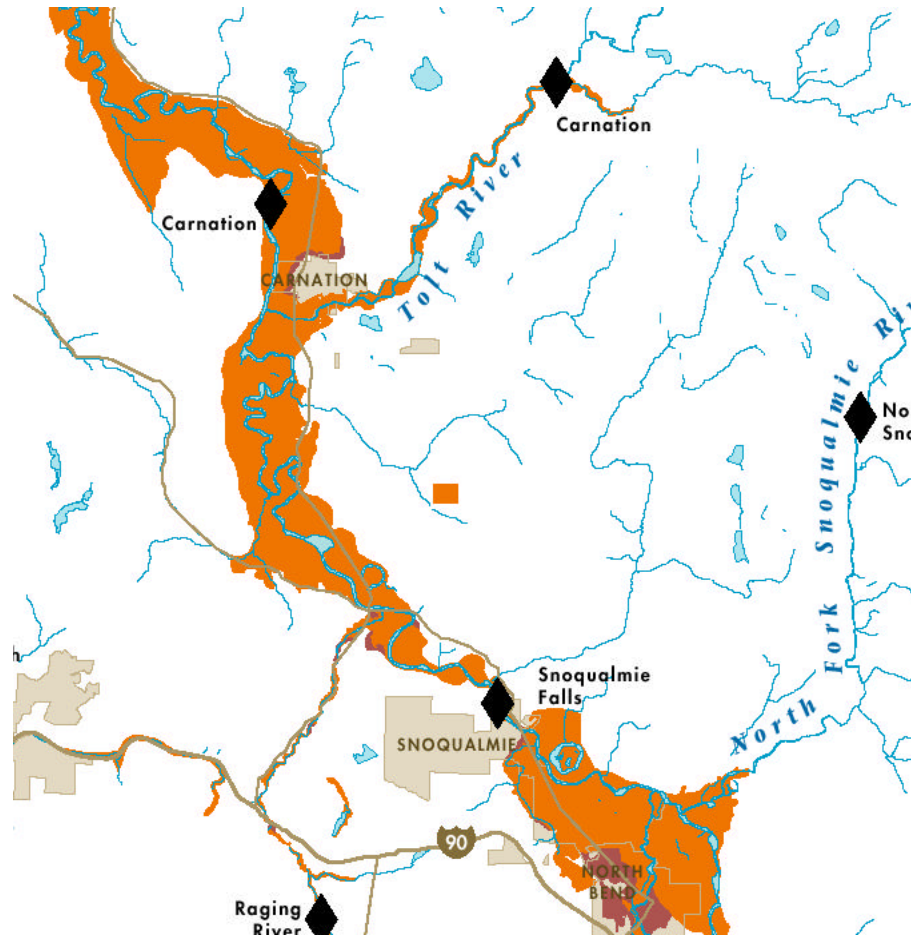
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Area Map



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Map courtesy of King County Dept. of Natural Resources

SNOHOMISH MEDIATED AGREEMENT



- Comprehensive Basin Plan w/dam
- Plan Died
- Post - SMA Flood Control Element
 - ~11,000 linear feet of excavation at
Snoqualmie
 - ~7,100 linear feet of setback levees at
North Bend
- Flood Warning System, Evacuation
Plans, and Hazard Information Plan

POST - SNOHOMISH MEDIATED AGREEMENT



- Snoqualmie Flood Control Element
 - ~11,000 linear feet of excavation
 - ~710,00 cubic yards
 - ~ *Currently 850 feet & 50,000 cubic yards*
- Reduced 100-year flooding by 2.5 to 3 feet within city
 - ~ *Currently 1.0 ft to 1.4 feet*

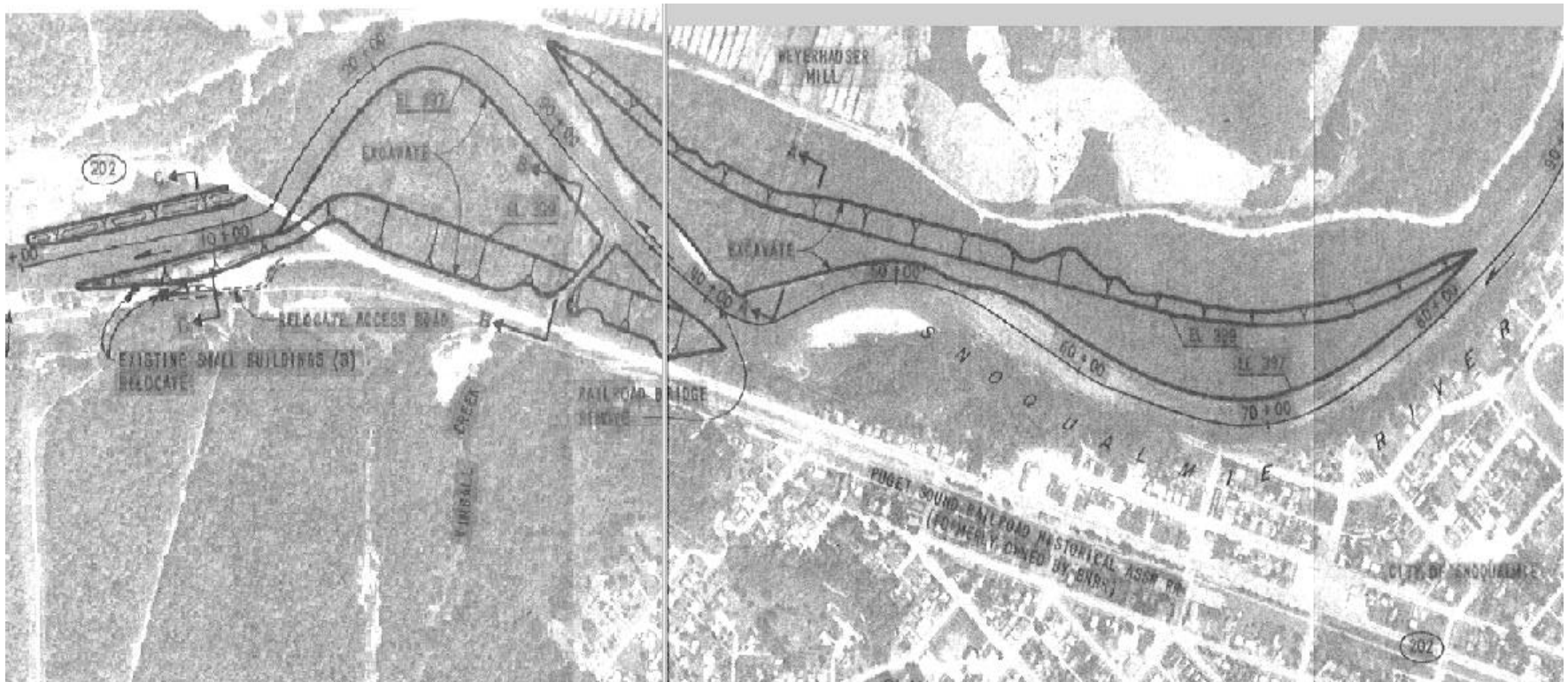
Post - SMA Plan at Snoqualmie



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1,000 feet





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Post - SMA Levee at North Bend

1,000 feet



1988 SNOQUALMIE FLOOD DAMAGE REDUCTION PLAN



- Snoqualmie Flood Control Element
 - ~Similar to Post - SMA plan, but no North Bend Levees
- Reduced 100-year flooding by about 3.2 feet
 - ~ *Currently 1.0 ft to 1.4 feet*

PROPOSED PROJECT



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Three elements:

- 900 linear feet of channel bank excavation
- Removal of Railroad Bridge
- Placement of stone on top of bank near SR 202

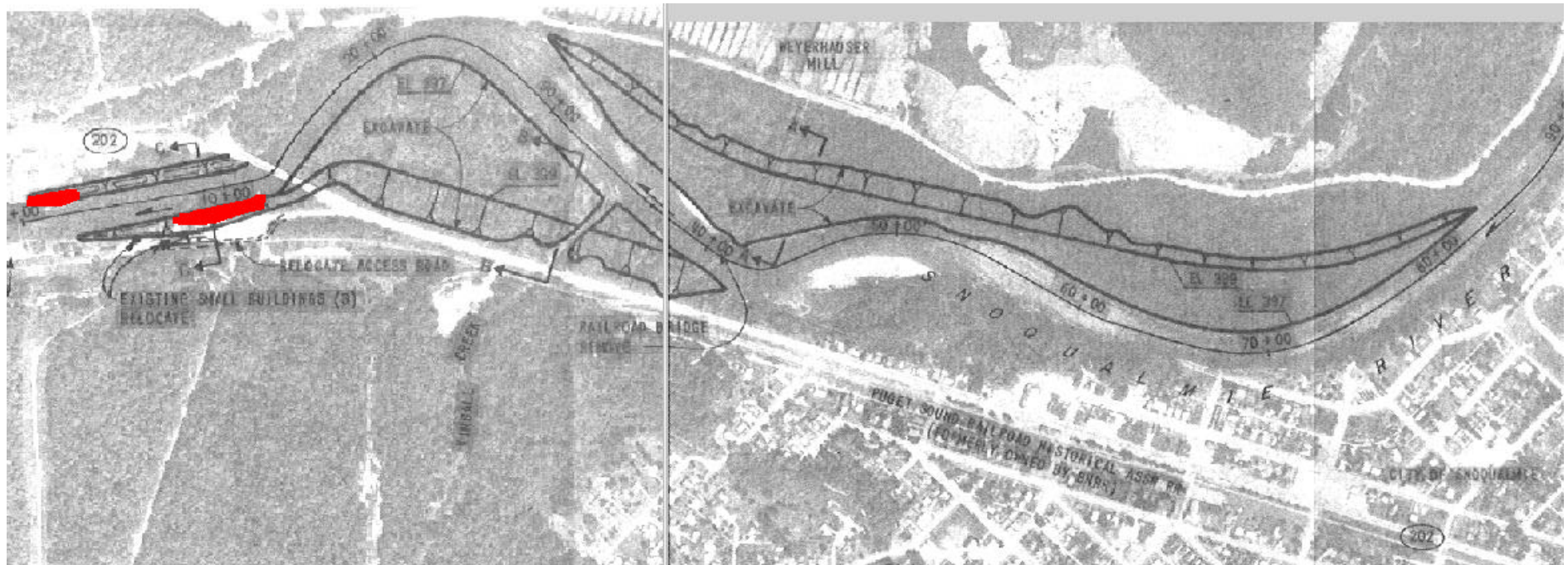


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Proposed Project Excavation

1,000 feet

Excavation

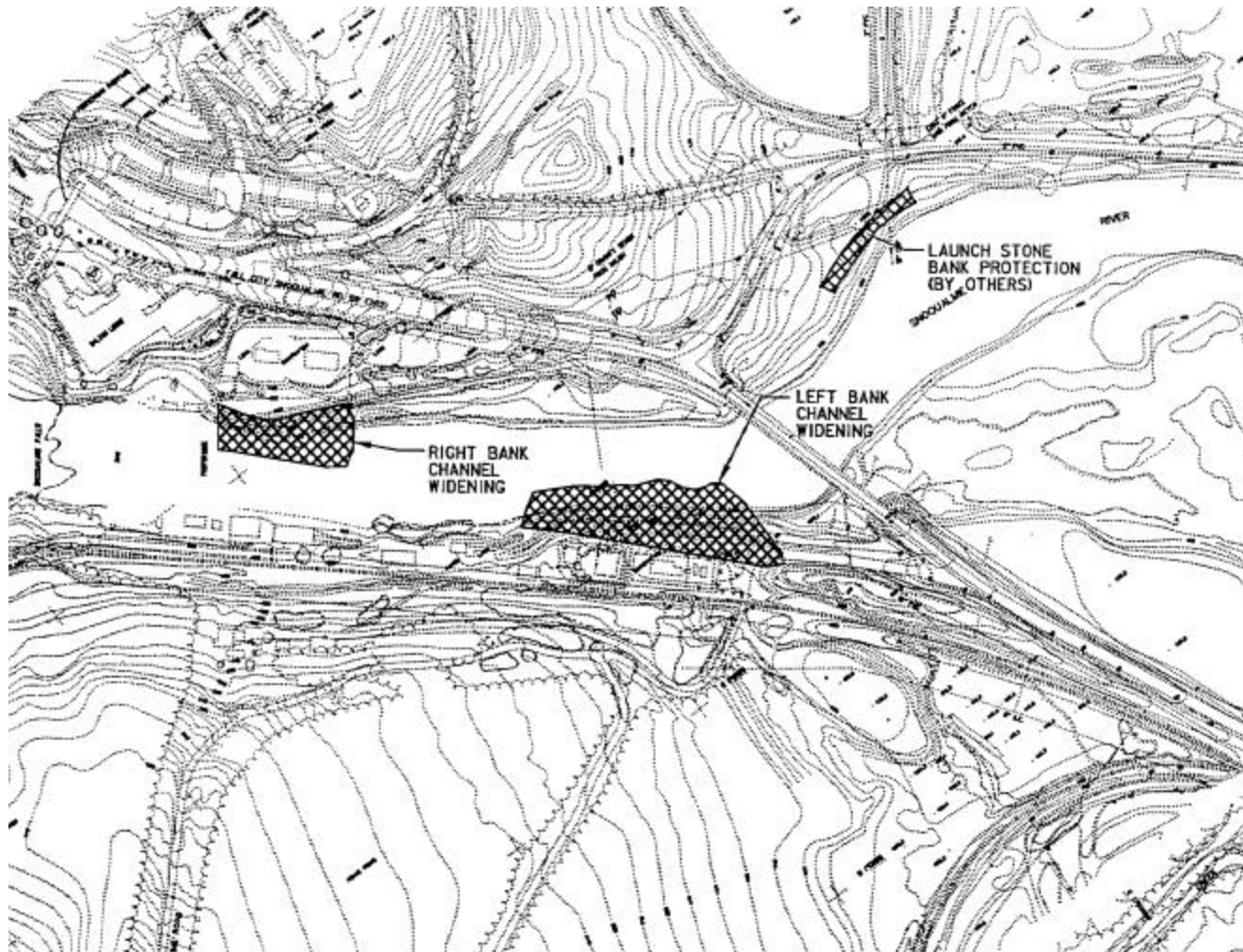


Project Excavation



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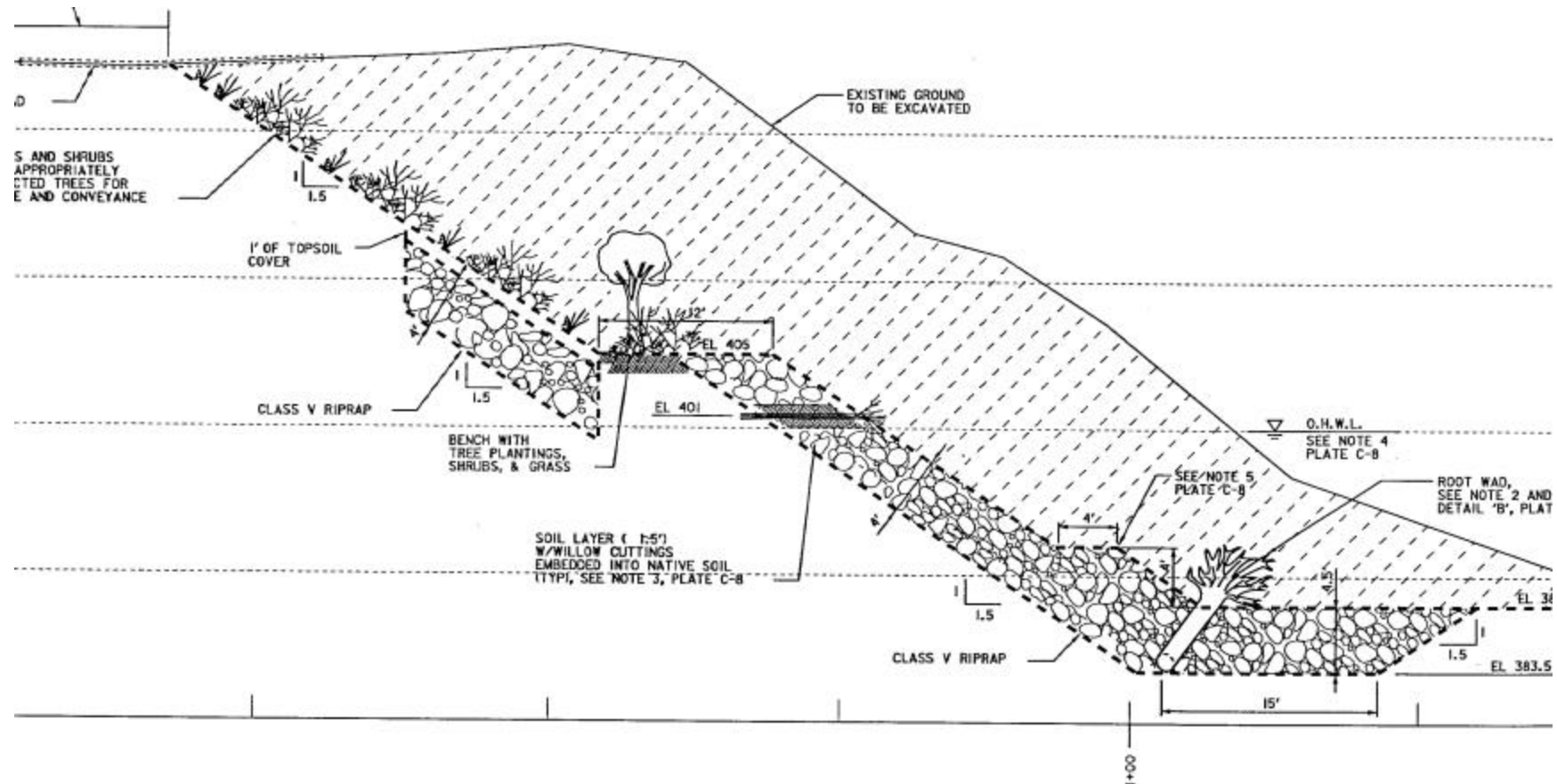
1,000 feet



Section of Max. Excavation



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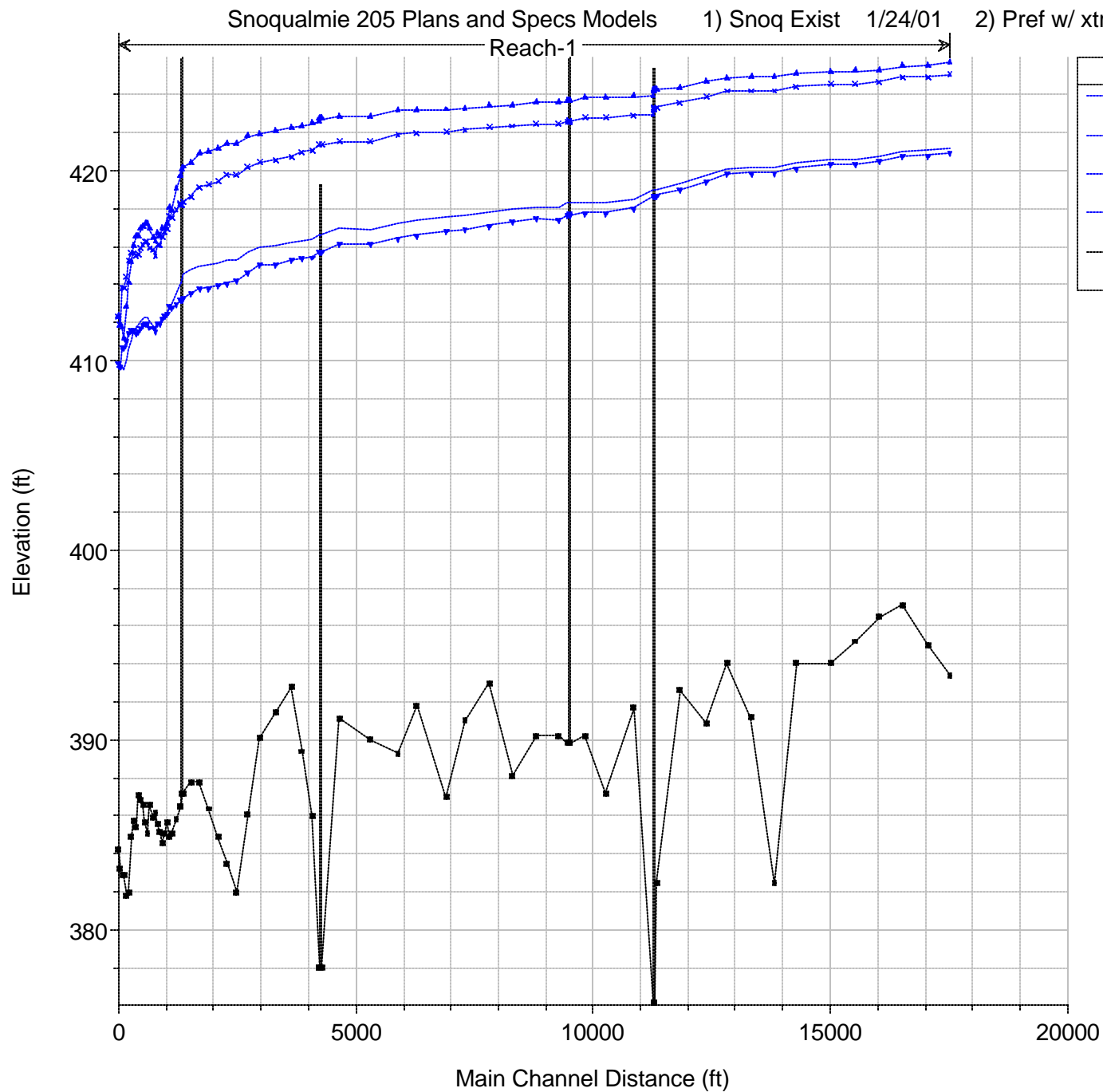


STATION 10+00 CROSS-SECTION

VERTICAL AND HORIZONTAL SCALE: 1" = 10'



20 feet



Legend
WS 100-yr - Snoq Exist
WS 100-yr - Pref w/ xtra
WS 10-yr - Pref w/ xtra
WS 10-yr - Snoq Exist
Ground



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DOWNSTREAM IMPACT ANALYSIS

- Prior Studies

1980s Snohomish Mediated Agreement and Snoqualmie River Flood Damage Reduction Study

→ Project at Snoqualmie Falls was much larger

→ Downstream impacts estimated using a detailed modeling effort

1999 Section 205 Detailed Project Report and Environmental Assessment

→ Assumed the new flood wave is perfectly translated to Carnation



DOWNSTREAM IMPACT ANALYSIS

- Prior Studies

1980s Snohomish Mediated Agreement and Snoqualmie River Flood Damage Reduction Study

→ 100-year flood elevations increased by 0.2 ft between the Falls and Carnation.

→ Flood waves arrived 1 to 2 hours sooner.

1999 Section 205 Detailed Project Report and Environmental Assessment

→ 100-year flood elevations increased by about 1 inch at Carnation.

→ Flood waves arrived about 1 hour sooner.



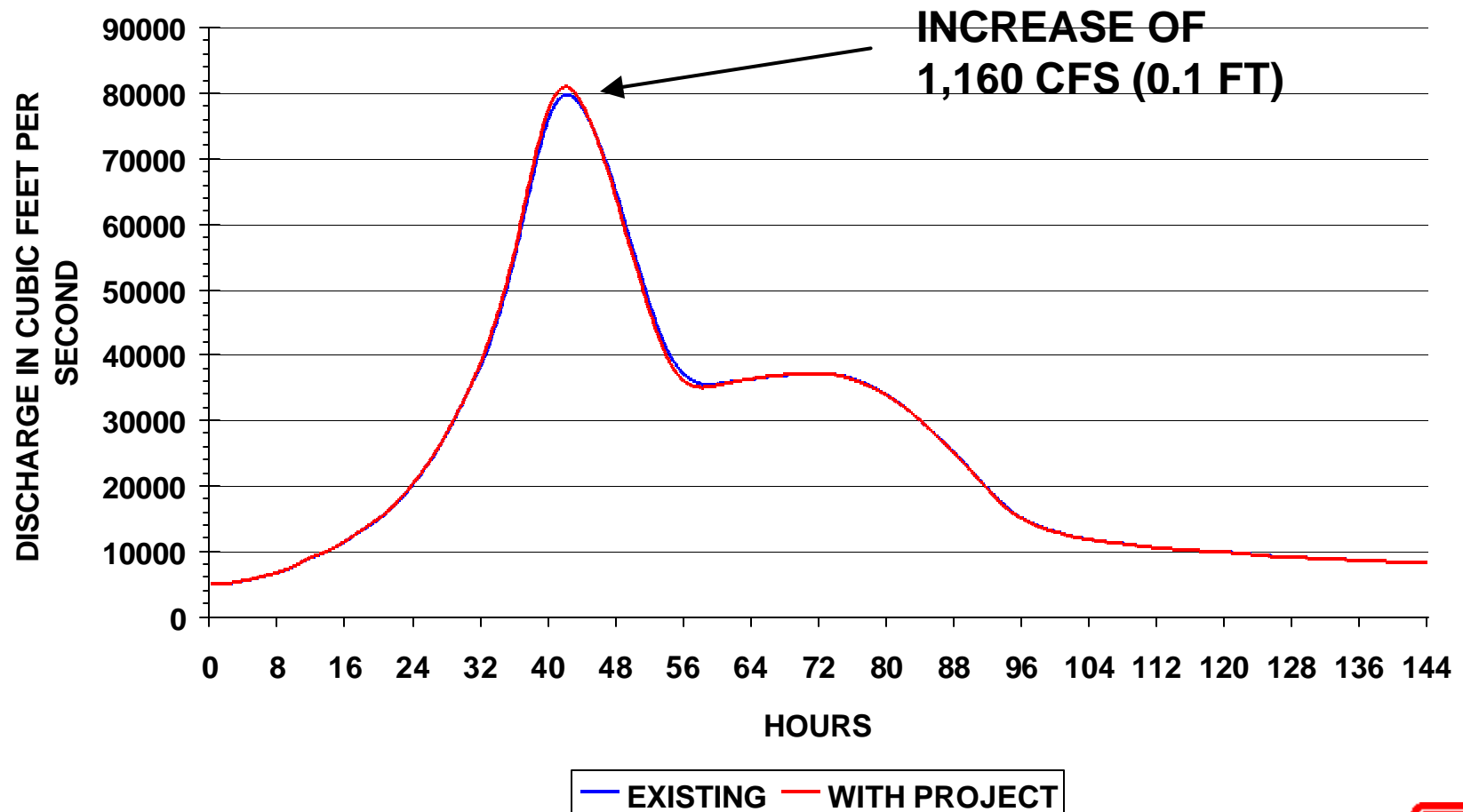
DOWNSTREAM IMPACT ANALYSIS

- Current Study
 - Based on the current flood damage reduction project
 - Uses an new unsteady flow model to estimate impact at Snoqualmie Falls
 - The new model uses the most recent hydrology and channel data
 - A different routing procedure was used to estimate the impact at Fall City and Carnation.
 - Goal: Determine the hydraulic impacts of the project at Snoqualmie Falls and to the downstream communities



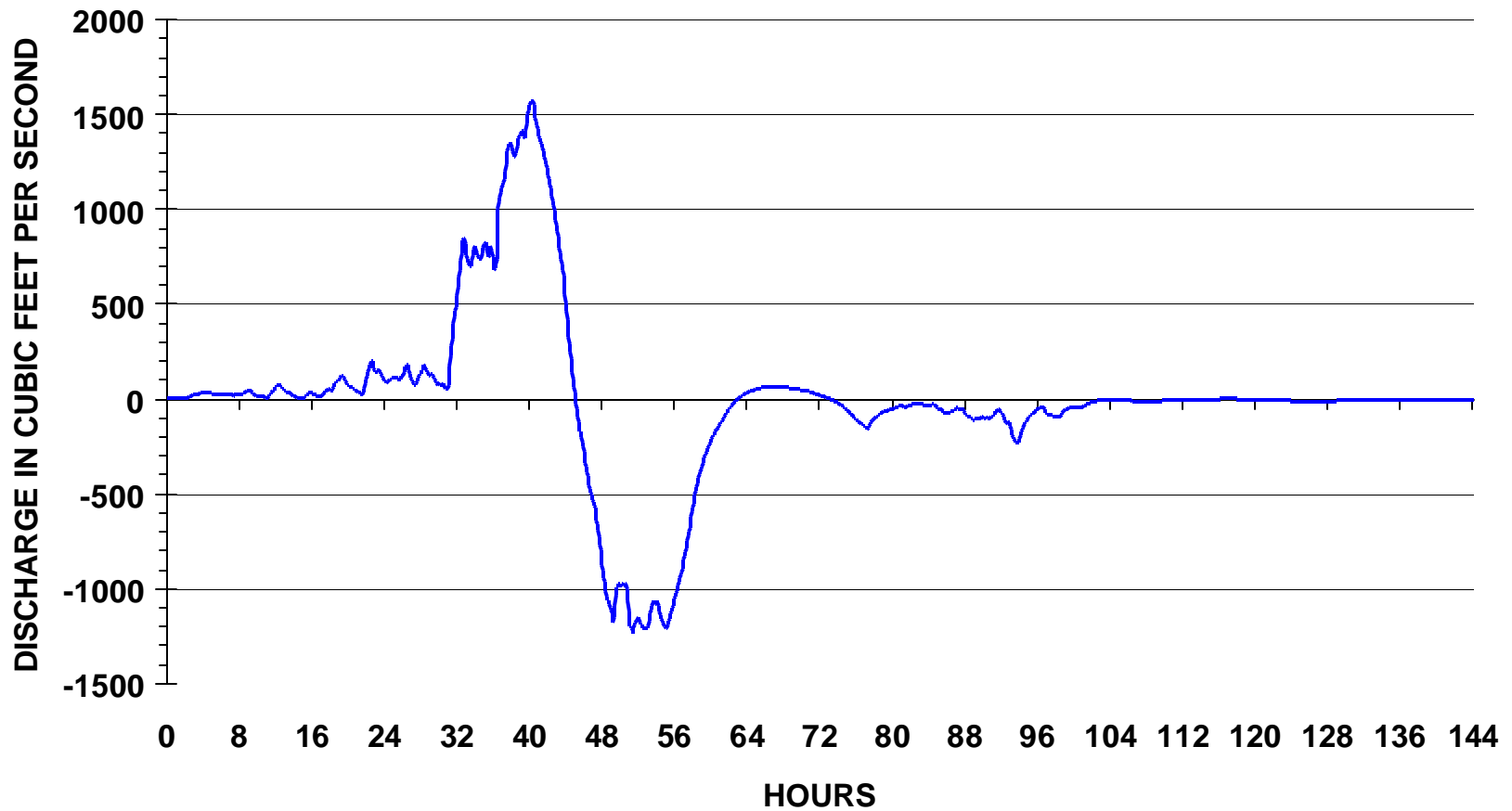
DOWNSTREAM IMPACT ANALYSIS

SNOQUALMIE RIVER AT SNOQUALMIE FALLS 100-YEAR FLOOD



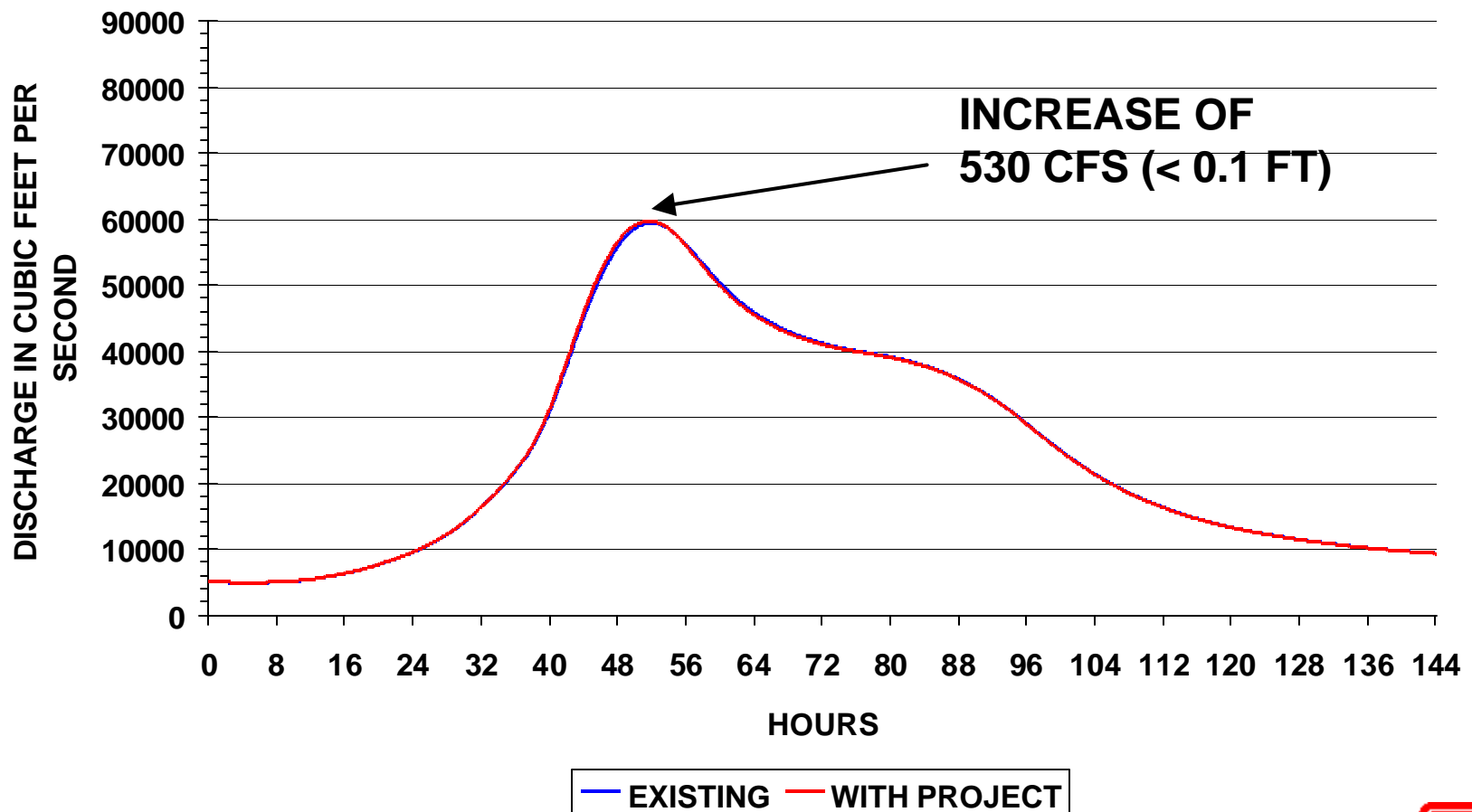
DOWNSTREAM IMPACT ANALYSIS

DIFFERENCE IN ROUTED FLOOD WAVE AT SNOQUALMIE FALLS 100-YEAR FLOOD



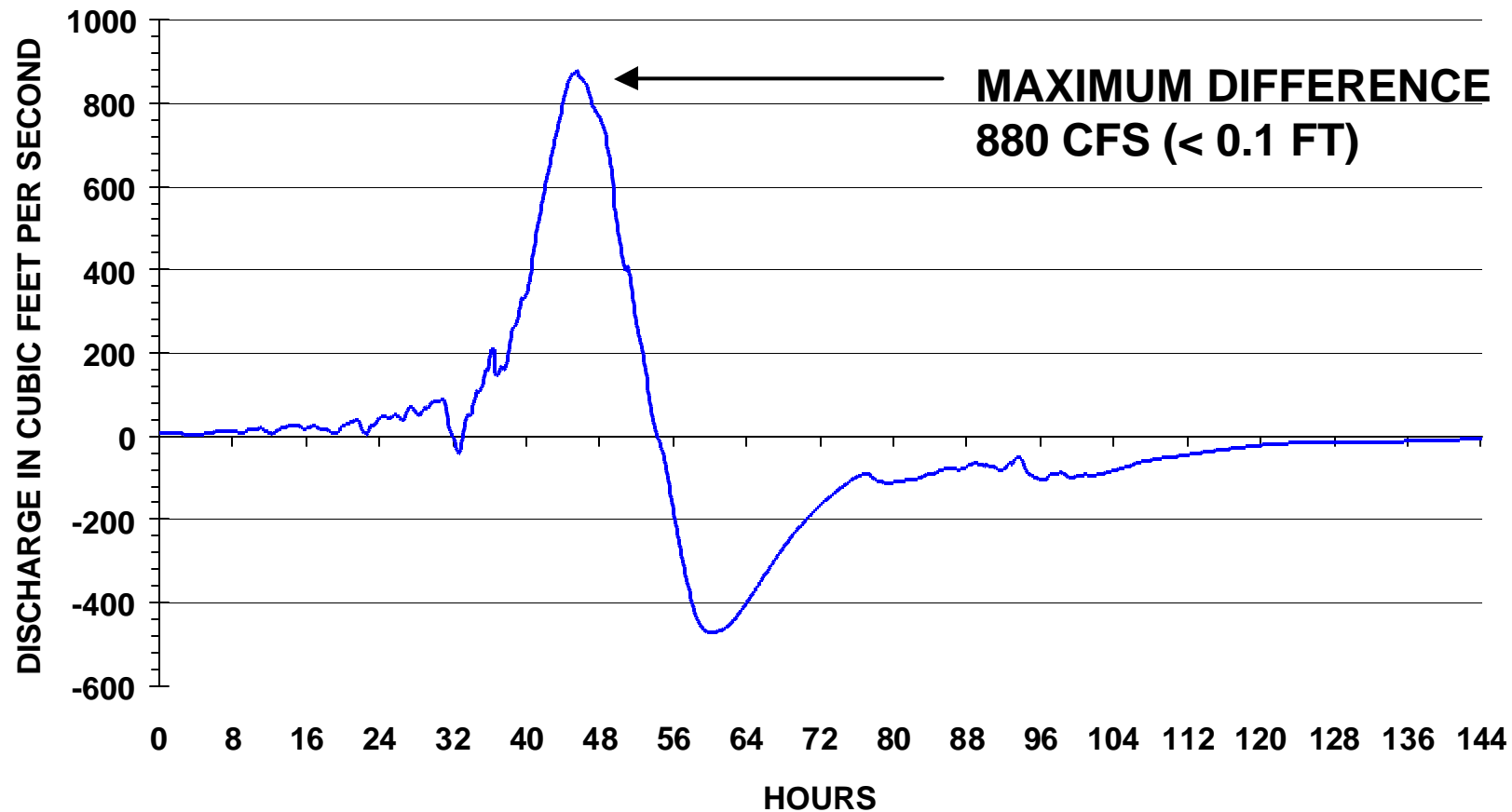
DOWNSTREAM IMPACT ANALYSIS

ROUTED FLOOD WAVE AT CARNATION 100-YEAR FLOOD



DOWNSTREAM IMPACT ANALYSIS

DIFFERENCE IN ROUTED FLOOD WAVE AT CARNATION 100-YEAR FLOOD



DOWNSTREAM IMPACT ANALYSIS

100-Year Flood

- Increase of 0.1 ft at Snoqualmie Falls
- Increase of about 0.1 ft at Fall City
- Increase of less than 0.1 ft at Carnation
- Flood wave arrives in Carnation 15 to 20 minutes sooner



DOWNSTREAM IMPACT ANALYSIS

Conclusions

- Stage increases estimated in this study suggest downstream impacts to be on the order of 0.1 ft.
- Timing changes estimated in this study suggest the flood wave will reach Carnation about 15 to 20 minutes sooner under project conditions.
- Impacts due to the project decrease with downstream distance from the Falls
- Impact due to the project are estimated to be zero downstream of Duvall.

